4 CRUDE MAJOR EWO NO. :	BE312-E1	REV: 0
PLANT: 4 CRUDE	SAP COST CENTER:	DD173-EXP
W/O # 313129-001	PROJECT / OUTAGE #:	SDD108A
V-1100 BOOT INTERNAL COATING		
MOC #:		

Level 1 - Management of Change Review

Will This Change:

- ☐ Cause the use of different feeds, chemicals, or catalysts?
- ☐ Cause the use of different process conditions, instrumentation, process control, or affect upstream/downstream plants?
- ☐ Cause the use of new or modified equipment (which is other than in-kind)?
- ☐ Alter equipment siting, building, trailer locations, roads, or fire protection?
- ☐ Require modifying existing and/or developing new procedures?
- ☐ Affect employee emergency response due to an organizational change?
- ☐ Transfer the responsibility for any environmental, health, or safety-related task?
- ☐ Alter the permanent staffing level or organization of any safety-sensitive job?

SAFETY OPERATOR	IN VOC SERVICE?	IN PLANT WELDING?
☒ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☒ No

APPROVALS

OPERATIONS :	K. Sohnrey	DATE: 9/8/11	PHONE: 2-2042
IMPACT. T.L :	P. Murphy	DATE: 9/8/11	PHONE: 2-1864
IMPACT. T.L :	M. Greenfield	DATE: 9/14/11	PHONE: 2-1179
MAINTENANCE:	V. Massaro	DATE: 9/14/11	PHONE: 2-5995

R. RAMIREZ
SEP 15 2011

Engineering Work Order - EWO

8/31/2011 8:25:19 AM

EWO #	6155	**Revision:**	0	**Created On:**	8/3/2011
Originator:	Black, Timothy S	**ABU:**	D&R	**Plant:**	4 Crude
MOC #:	23801	**Section Two Reviewer:**	Preciado, Silvano E.	**Equipmen#:**	V-1100
Passport W/O:	313129	**Project Number:**		**EWO Type:**	Shutdown
Item:		**SAP Cost Center:**		**Status:**	Approved
S/D EWO #:	BE312-E1				

Title: V-1100 Boot Internal Coating EWO - 4Crude S/D 4Q2011

Scope: The purpose of this EWO is to define the work scope for the internal coating of the V-1100 boot section.

- ☐ **Cause the use of different feeds, chemicals, or catalysts?**
- ☐ **Cause the use of different process conditions, instrumentation, process control, or affect upstream/downstream plants?**
- ☑ **Cause the use of new or modified equipment (which is other than in-kind)?**
- ☐ **Alter equipment siting, building, trailer locations, roads, or fire protection?**
- ☐ **Require modifying existing and/or developing new procedures?**

Technical Basis For Change: The V-1100 Boot will be internally coated with Belzona 1521 on the upcoming 4Q2011 4Crude S/D. This is to prevent further Hydrogen charging into the base metal, which has experienced significant HIC damage. The vessel is currently operating under a Level 2 Fitness-for-Service (FFS) due to these laminations and inclusions. Equipment drawings and SI

Safety Operator Required? Yes **In VOC Service?** Yes **In Plant Welding?** No

	Person Responsible	Notified On	Completed By	Completed On
Design Review	Black, Timothy S.	8/4/2011		
Process Engineering Review				
Instrumentation Review				
Control System Review				
Utilities Review				
Environmental/Regulatory Review	Elliott, Brad B.	8/4/2011		
Land Usage Review				
VOC Review				
Safety/Regulatory Review				
Building Permits Review	Jensen, John D.	8/4/2011	Jensen, John D.	8/4/2011
Mechanical Review				
Inspection Review				
Metallurgy Review				
Contruction Review				
Relief System Review				
Infrastructure Review				
aTrac Review				
Fire Proection Review	Bosworth, Gregory A.	8/4/2011	Bosworth, Gregory A.	8/8/2011
PHA/HSE Review	Preciado, Silvano E.	8/4/2011		

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Approvers Section

Lead Engineer:	Murphy, Patrick K.	8/26/2011	Murphy, Patrick K.	8/26/2011
Maintenance:	Massaro, Vincent R.	8/26/2011	Massaro, Vincent R.	8/30/2011
Building Permit:	Linares, Elena E.	8/26/2011	Tuma, Dennis A.	8/29/2011
Inspection:				
Operations:	Sohnrey, Kenneth C.	8/26/2011	Sohnrey, Kenneth C.	8/26/2011

1.0 SCOPE

This eEWO defines the work scope for the internal coating of the **V-1100 boot section**. This work is also covered under **MOC #23801**.

2.0 MATERIAL

- Contractor to procure all needed Belzona 1521 Coating media prescribed in this Work Order. **Obtain enough Belzona 1521 to be able to properly spray coat approximately 400 square feet of steel**. Include any additional quantity as needed for contingency and to account for typical waste amounts, as applicable.
- All other materials to be supplied by Maintenance and/or Contractor. **See Maximo Work Order #313129.**

3.0 QUALITY CONTROL REQUIREMENTS

- A Daily Coating Inspection Report must be completed for each day of the job starting with surface preparation and continuing until coating has cured. Attached form COM-EF-844 (Coatings Inspection Daily Report Form) may be used if third party inspector does not have one of his own.
- Third-party inspector shall set hold points with the coating contractor **before any of the work begins**. Third-party inspector shall inspect and set hold-points according to the following documents:
    - Sketch SK-6155-1: V-1100 Vessel Drawing
    - COM-SC-5014-D: Internal Coatings for Vessels in Wet H_2S Service
    - Belzona 1521 Instruction Sheet
    - CHLOR*RID Soluble Salt Remover Instructions
    - CHLOR*TEST Test Kit Instructions.
- All alternatives to the instructions of this EWO must be reviewed and approved by the Chevron Engineer.

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4.0 WORK DESCRIPTION

4.1 General Work Requirements

4.1.1 Work shall be in accordance with the following:

- This specification/EWO
- Manufacturer's Specification for Surface Preparation and Coating Application **(Belzona 1521)**
- CHLOR*RID Data Sheet and Directions
- Internal Coatings for Vessels in Wet H_2S Service: **COM-SC-5014-D**
- Third Party NACE Certified Coating Inspector feedback

4.1.2 **THESE ARE GENERAL COATING WORK INSTRUCTIONS BUT ALL THE WORK SHALL FOLLOW THE MANUFACTURER INSTRUCTIONS AS WELL AS ANY ADDITIONAL INSTRUCTIONS FROM THE THIRD PARTY INSPECTOR. COATING CONTRACTOR MUST COMPLY WITH THE THIRD PARTY INSPECTORS' HOLD POINTS, REFER TO SECTION 3.0 QUALITY CONTROL REQUIREMENTS.**

4.1.3 **NOTE: COATING SHALL TAKE PLACE ONLY AFTER ALL REQUIRED VESSEL REPAIRS HAVE BEEN COMPLETED.**

4.1.4 **NOTE: THIS IS AN ASME SECTION VIII CODE VESSEL. NO GRINDING SHALL BE PERFORMED WITHOUT PRIOR APPROVAL FROM THE CHEVRON AUTHORIZED INSPECTOR (AI). ANY GRINDING SHALL BE PERFORMED BY A CONTRACTOR WHO IS CERTIFIED TO BUILD/REPAIR CODED VESSELS. CODE TRAVELER TO FOLLOW ANY CODE WORK. ALL GRINDING AT PRESSURE BOUNDARIES SHALL BE INSPECTED BY A CHEVRON AI.**

4.2 **Prior to doing any work, contact the AI (John Beauregard 2-5187) to determine exact location of surface preparation and coating application, and/or any code work. General location is shown on Sketch SK-6155-1.**

- **NOTE: COATING TO PROTRUDE 3" PAST THE INTERNAL SHELL TO BOOT WELD**

4.3 Surface Preparation

4.3.1 Prepare and clean boot internal surfaces for abrasive grit blast per Section 7.2 of COM-SC-5014-D and Step 1(a) of Belzona 1521 Instructions sheet.

4.3.2 Test surfaces with CHLOR*TEST test kit, or equivalent, prior to abrasive blasting to ensure salt contamination (nitrates, chlorides, and sulfates) does next exceed limits outlined in Section 5.b. of COM-SC-5014-D. If any of these limits are exceeded, perform

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high-pressure water washing (minimum 3000 psi) using a solution of water and CHLOR*RID soluble salt remover, or equivalent. Retest salt contamination levels as necessary, until levels are acceptable per COM-SC-5014-D, Section 5.b.

4.3.3 After successful CHLOR*TEST, abrasive blast internal metal surfaces to be coated. Abrasive blast to American Standard Near White Finish SSPC SP10.

4.3.4 Clean out spent blast medium as necessary

4.3.5 Prior to applying coating, third-party Coatings Inspector to inspect surface preparation as necessary. See Section 3.0 for details.

4.4 Coating Application

4.4.1 **Prior to doing any work, contact the AI (John Beauregard 2-5187) to determine exact location of coating application. General location is shown on Sketch SK-6155-1.**

- **NOTE: COATING TO PROTRUDE 3" PAST THE INTERNAL SHELL TO BOOT WELD**

4.4.2 Position and utilize de-humidifying equipment as necessary to maintain necessary humidity levels for coating (see Belzona 1521 Instructions sheet for details).

4.4.3 Tape edges of non-coated areas, at interface, prior to coating application to prevent thin edges.

4.4.4 Prior to using spray process to coat vessel boot internal surfaces, Belzona 1521 can be brush applied to "pre-coat" detail areas such as brackets, nozzles, welds, corners, and edges. Check with Chevron AI to confirm locations, where this may be needed. NOTE: Coating thickness requirements as outlined in COM-SC-5014-D, Appendix A, Table 1, must be observed in all coated areas.

4.4.5 Apply Belzona 1521 directly onto the prepared surfaces using airless spray application. Verify application technique and thickness, including holidays, voids, and pinholes. Belzona 1521 must be applied between 25-40 mils DFT in strict accordance with the manufacturer's application instructions and COM-SC-5014-D, Appendix A, Table 1.

4.4.6 Inspect application of Belzona 1521 coating per Section 3.0 of this EWO.

4.4.7 Any misses, pinholes, or mechanical damage found in the coating should be repaired by brush blasting or abrading the surface to produce a frosted appearance prior to cleaning the surface and application of further material.

4.4.8 Perform any final inspections as called out by the Third-Party Coating inspector per Section 3.0.

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5.0 ATTACHMENTS

- **SK-6155-1**------V-1100 Vessel Equipment Drawing _____1 Sheet
- **COM-SC-5014-D**------Internal Coatings for Vessels in Wet H_2S Service – Coating Specification_____21 Sheets
- **Belzona 1521 Instruction Sheet** _____2 Sheets
- **COM-EF-844**------Coatings Inspection Daily Report_____1 Sheet

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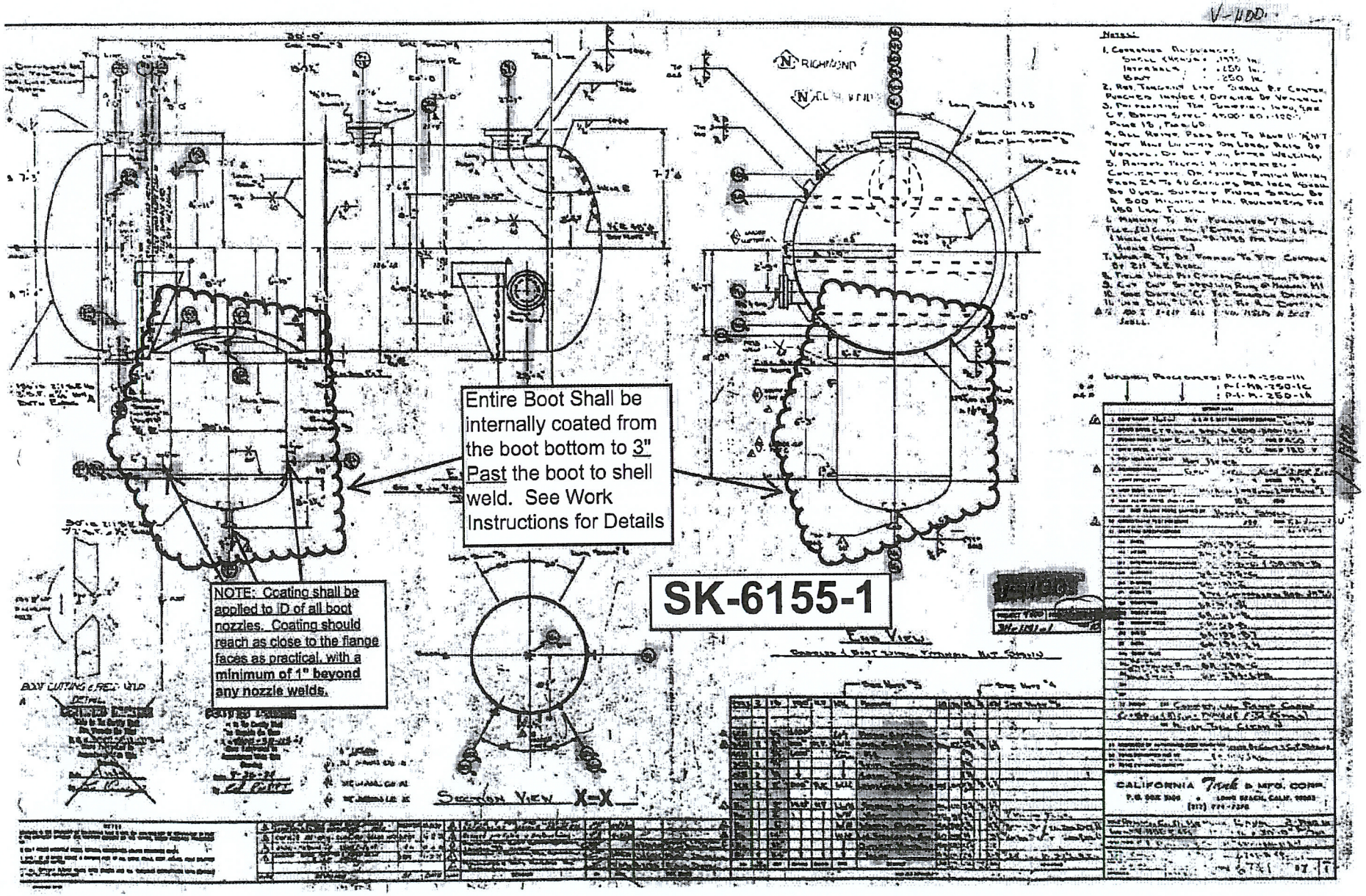

COATINGS INSPECTION REPORT FORM
DAILY REPORT

Contractor:	Date:	Attachment	
Passport/Project No.:	Chevron Coating System:	☐ DFT Sheet	☐ NCR
Location:	Company Rep.:	☐ Soluble Salts Test	
Description:	Project Eng:	☐ Anchor Profile Report	
Specification Number:	Days on Job:		

Description of Work Area & Activities

Ambient Conditions

Time of Day				
Dry Bulb Temperature (°F/°C)				
Wet Bulb Temperature (°F/°C)				
Relative Humidity	%	%	%	%
Dew Point (°F/°C)				
Surface Temperature (°F/°C) min/ma	/	/	/	/
Wind Direction / Speed				
Weather Conditions:				

1. Existing Conditions

☐ Steel	☐ Concrete	☐ Pitting
☐ New	☐ Maintenance	☐ Primed
☐ Crevices	☐ Sharp Edges	☐ Welds
☐ Mill Scale	☐ Rust Scale	

Degree of Contamination

☐ Chlorides	☐ Sulfates	☐ Nitrates
☐ pH	☐ Grease	☐ Oil

Inspections and Approvals Performed

☐ 1. Existing Conditions Inspections	Approved:	
☐ 2. Surface Preparation Monitoring	Approved:	
☐ 3. Surface Cleanliness / Profile	Approved:	
☐ 4. Approved to Paint	Approved:	
☐ 5. Application Monitoring / WFT	Approved:	
☐ 6. Paint Inspection / DFT	Approved:	
☐ 7. Final Inspection	Approved:	
☐ Non-Conformance	Report #	
☐ Equipment per Application Data Sheet	Approved:	

2. Surface Preparation Monitoring

Start	Finish	FT^2/M^2
☐ Solvent Clean	☐ Hand Tool	☐ Power Tool
☐ HP Wash psi	☐ Wet Abrasive Blast	
☐ Abrasive Blast	☐ Blast Media	
☐ Air Supply cfm	☐ Nozzle psi	
☐ Blotter Test-OK	☐ Abrasive Analysis-OK	
☐ Moisture/Oil Traps-OK	☐ Equipment Check-OK	

3. Surface Cleanliness and Profile

☐ SSPC SP-	☐ Surface Preparation Approved	
☐ SSPC VIS-1	☐ SSPC VIS-3	☐ SSPC VIS-4
☐ Profile Check		
☐ Specified mils	☐ Achieved mils	
☐ Magnetic Base mils	☐ Press-O-Film Test-OK	

4. Approved to Paint

☐ Surface Clean	☐ Press-O-Film Test-OK	
Painted Surfaces		
☐ Min Recoat	☐ Max Recoat	
☐ Overspray	☐ Runs / Sags	☐ Pinholes
☐ Holidays	☐ Damage	☐ Mileage-OK
☐ Other:		

5. Application Monitoring and WFT Measurements

Start	Finish		FT^2/M^2
☐ Primer	☐ Intermediate	☐ Finish	☐ Touch-up
Manufacturer		Quantity Mixed	
Product:		Mix Ratio	
Color		Material Temp (°F/°C)	
Reducer:		Induction Time	
Reducer Batch #		Pot Life	
Batch Numbers		Application Method	
A:	B:	☐ Airless	☐ Conventional
A:	B:	☐ Brush / Roll	☐
☐ Specified WFT: mils		☐ Achieved WFT mils	
☐ Blotter Test-OK		☐ Continuous Agitation	
☐ Coverage FT^2/M^2 / Gallon		Reducer added	

6. Paint Inspection / DFT Measurements

☐ Coating Inspected:			
☐ Visual Inspection	PASS	FAIL	
☐ DFT Gage Calibrated	Yes / No	☐ Shims	☐ NIST Tiles
☐ DFT Measurements	Low	High	
☐ Defects Detected	YES	NO	
☐ Overspray	☐ Runs / Sags	☐ Pinholes	☐ Cracking
☐ Holidays	☐ Damage	☐ Other	

7. Final Inspection

☐ Coating System Inspected:		
☐ Final Inspection	PASS	FAIL

QC Inspector Signature | Date